1897 — 1898

County

Borough of Middlesbrough.

HEALTH DEPARTMENT.

ANNUAL REPORTS

OF THE

Medical Officer of Health

AND THE

Chief Sanitary Inspector,

FOR THE YEAR ENDING THE 31st DECEMBER, 1898,

Including the Final Report on the SMALL-POX EPIDEMIC
of 1897 and 1898.

Middlesbrough:
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MIDDLESBROUGH:
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1899.

The County Borough of Middlesbrough.

Members of The Sanitary and Sanatorium Committees.

November, 1898.

His Worship the Mayor (Mr. Councillor W. T. Keay).

Mr. Alderman S. A. Sadler, J.P.,
Chairman of the Sanitary Committee.

Mr. Alderman R. Archibald
,, ,, W. Bulmer, J.P.
,, ,, A. Hinton
,, ,, T. Jones
,, ,, J. McLauchlan
(Chairman of Sanatorium Com.)
,, ,, W. Taylor
,, ,, J. Wilson, J.P.
,, ,, R. Scupham
Mr. Councillor D. Almgill
,, ,, J. Barker
,, ,, S. Barron
,, ,, J. Benfield
,, ,, W. Bruce
,, ,, R. Burrows
,, ,, E. Cone
,, ,, T. Dent
,, ,, T. Dodgson

Mr. Councillor A. Dorman
,, ,, C. Duncan
,, ,, C. Ephgrave
,, ,, J. Forbes
,, ,, J. Hedley, M.D., J.P.
,, ,, A. Main
,, ,, P. Marsh
,, ,, R. Mascall
,, ,, A. Mattison
,, ,, D. McArthur
,, ,, J. Newhouse
,, ,, J. Newby
,, ,, B. McNulty
,, ,, T. Poole
,, ,, W. Roberts
,, ,, T. Ward
,, ,, A. Webster, M.R.C.S.

Sanitary Staff.

Chief Sanitary Inspector:
GEORGE H. ANDERSON, Assoc. San. Inst.

Assistant Sanitary Inspectors:
THOMAS McDONALD. JOHN SNOWDON, C.S.I. JOHN ASTLEY.

Clerk:
HENRY WATSON.

Matron of the Sanatorium:
Miss K. BELL.

Medical Officer of Health and Medical Superintendent of the Sanatorium:
CHARLES V. DINGLE, M.D., B.Hy., etc.

Borough of Middlesbrough, 1898.

Area of Municipal Borough	2,824 acres.
Number of Houses	16,210
Length of Public Streets in use	38¼ miles
Rateable Value	£301,068

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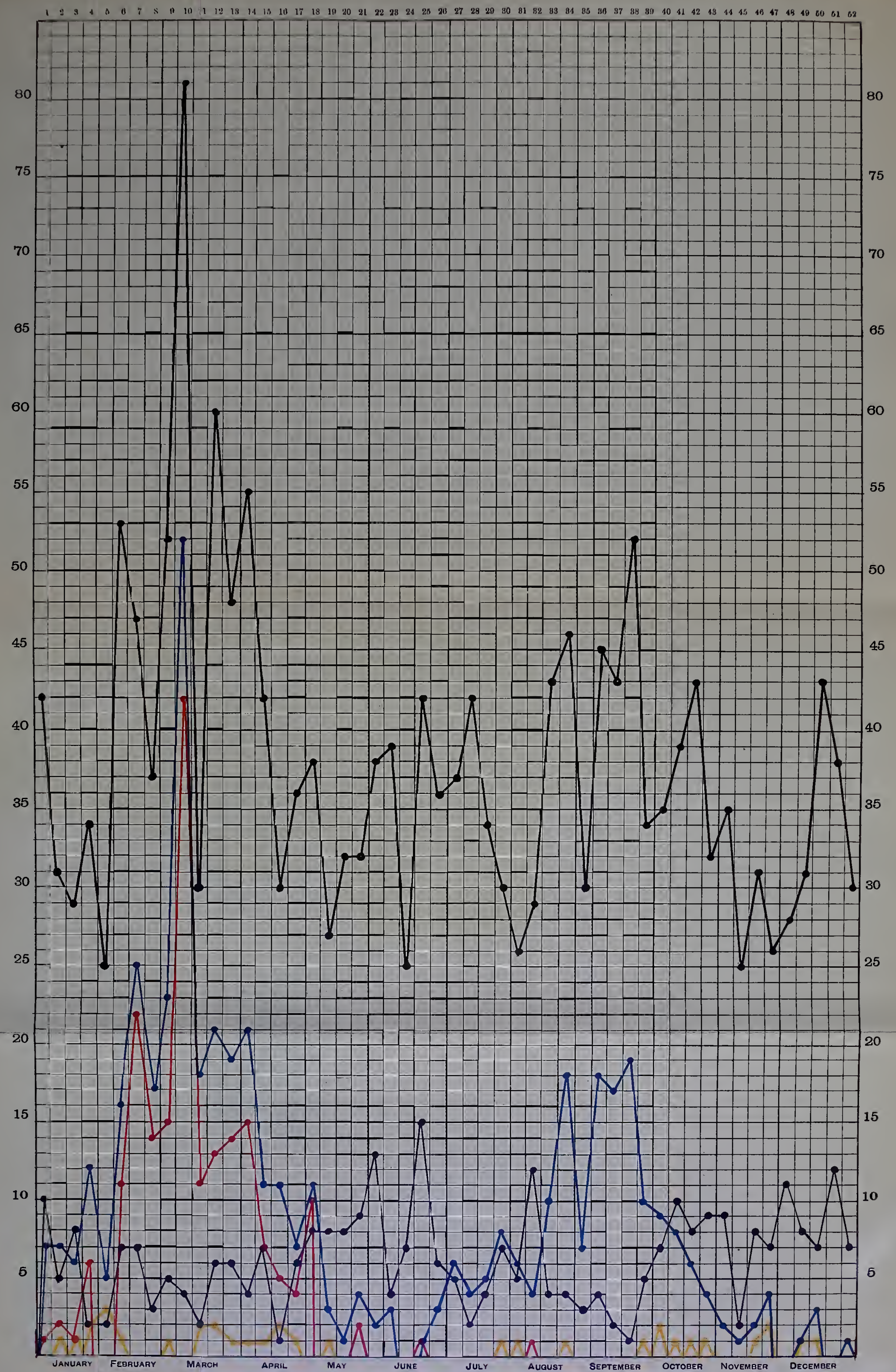
Chart showing the total deaths in the 52 weeks ending December 31st, 1898. Those from Small-pox, the chief Zymotic Diseases, Diseases of the Respiratory System, and Enteric (Typhoid Fever) are shown by themselves.



The rise in the total deaths in the first quarter of the year was due to Small-pox, and in the last quarter to Diarrhœal Diseases.

Total number of deaths shown thus

Deaths from Zymotic Diseases — Deaths from Respiratory Diseases — Deaths from Small-pox. — Deaths from Enteric Fever.

To the Chairman (Alderman S. A. Sadler, J.P.), and Members of the Sanitary Committee of the Corporation of the County Borough of Middlesbrough.

Gentlemen,—Herewith I beg to submit to you my first Annual Report, viz.: that for the year 1898.

The "Death Rate" from all causes is 21·77 per 1,000 population, the average rate in 33 large Towns in the United Kingdom for the previous year was 20·7.

The rate for the year 1897 in Middlesbrough was 19·16, showing that there has been an increase in the death rate during the past year. This has been due to exceptional circumstances, of which 198 deaths from Small-Pox may be mentioned as the chief. There were 35 uncertified deaths registered during the year.

The following are the death rates for the past ten years:—

In 1889 ...	... 20·21	In 1894 ...	.. 17·65
„ 1890 ...	... 21·52	„ 1895 ...	... 19·31
„ 1891 ...	... 22·70	„ 1896 ...	... 19·64
„ 1892 ...	... 19·87	„ 1897 ...	... 19·16
„ 1893 ...	... 21·03	„ 1898 ...	... 21·77

The average death rate for these 10 years being 20·28 per 1,000 per annum. The greatest number of deaths took place during the first quarter of the year 1898, this being the period during which the Small-Pox Epidemic was at its worst.

The principal Zymotic Diseases (which include Small-Pox, Scarlet, Measles, Enteric, Typhus, Diphtheria, Whooping Cough, Simple or Continued Fevers and Diarrhœa) have caused 383 deaths, against 189 during the previous year, giving a Zymotic death rate of 4·2 per 1,000 for the year.

For comparison with other towns see Table 1.

The total number of Infectious Diseases notified by Medical Practitioners during the year is 2,032, against 571 in the previous year. The great increase is due to the 1,397 cases of Small-Pox notified in the town during 1898.

For a comparison between this and the previous year and for the Wards in which the cases occurred during 1898 see Table VII.

Births.—The number of Births registered within the Borough during the year ending December 31st, 1898, is 2,904, composed of 1,409 males and 1,495 females, giving a birth-rate for the year of 32·52 per 1,000 of the population. This is a decrease of 0·83 per 1,000 on last year's births. The rates for the past ten years have been, viz.: —

1889	36·76	1894	35·76
1890	37·07	1895	32·91
1891	39·63	1896	31·70
1892	35·76	1897	33·35
1893	38·76	1898	32·52

or an average birth rate for the 10 years of 35·42 per 1,000 of the population.

Mortality at the different Age Periods.—The 1,967 deaths include 885 under 5 years of age, or 44·9 per cent. of the total deaths; between 5 and 10 years, 56 deaths, or 2·8 per cent.; between 10 and 15 years, 38 deaths, or 1·9 per cent.; between 15 and 25 years, 121 deaths, or 6·1 per cent.; between 25 and 60 years, 587 deaths, or 29·8 per cent.; over 60 years, 280 deaths, or 14·2 per cent.; showing that by far the greatest mortality occurs amongst the young children in the Borough.

Zymotic Diseases.—Small-Pox which broke out in November, 1897, continued with increased severity during the first half of the year, 1898, and caused 198 deaths. For the general Statistics, comprising the whole period of this Epidemic, see Apendix B., Page 36.

Enteric (Typhoid) Fever.—There were 234 cases notified, and 32 deaths, against 166 cases and 29 deaths the previous year. The rate of mortality to cases notified is 13·6 per cent. For the Wards in which the cases occurred, see Table X.

The greatest number occurred during the Autumn, in October and November, which is the usual period during which Enteric Fever may be expected.

This increase was general throughout the country, and in this district was attributable to the exceptional dry summer of 1898.

By far the greatest number of cases occurred in houses which possessed ashpit middens (in comparison with the number of ashpit middens to pan closets), viz.: in the 234 cases notified it was found that 68 occurred where there was a midden-privy, 152 where there was a pan closet, and 14 in houses with a water closet.

The number of cases occurring in houses with midden privies equals 3·0 per cent. of such houses, and the number in houses with pan closets only 1·5 per cent., that is, the rate of Enteric Fever cases in the former houses is twice as great as it is in the latter. See Table XI.

Midden Privies for many reasons, of which the above is only one, should be abolished as soon as possible.

The following have been the death rates per 1,000 of the population in Middlesbrough from Enteric Fever during the past ten years. :—

	Death Rate per 1,000 of the population from Enteric (Typhoid) Fever		Death rate per 1,000 of the population from Enteric (Typhoid) Fever
1889	·26	1894	·26
1890	·86	1895	·32
1891	·74	1896	·40
1892	·20	1897	·32
1893	·61	1898	·35

Scarlet Fever.—There were 237 cases notified and 8 deaths, against 245 cases and 11 deaths in the previous year The rate of mortality to cases notified is 3 3 per cent. Scarlet Fever in Middlesbrough for some years has been of a very mild type.

Diphtheria —54 cases were notified and 14 deaths occurred, against 38 cases and 13 deaths in the previous year, the mortality rate to notified cases is 25·9 per cent. Most of the deaths occurred during the first quarter of the year.

Measles has been prevelent during the whole year and caused 63 deaths, against 10 deaths in the previous year. Of these deaths 17 occurred in the district East of Boundary Road, 29 to the West of Boundary Road. and 15 to the North of the Railway. There were 2 deaths from Measles in Public Institutions. 62 of the deaths were of children under 5 years of age.

Not being a notifiable disease, I am unable to say how many cases occurred.

Whooping Cough caused 9 deaths, against 66 in the previous year. All the deaths were of children under 5 years of age, and, with the exception of 1, occurred in the first quarter of the year and to the East of Boundary Road.

Erysipelas.—98 cases were notified and there were 3 deaths, against 93 and 2 deaths the previous year. The rate of mortality to cases notified is 3·0 per cent.

Typhus Fever.—There was 1 case notified and 1 death, and the same the previous year.

Continued Fever.—1 case was notified and there was one death.

Puerperal Fever.—There were 3 notifications and 2 deaths, 1 North of the Railway and 1 in a Public Institution ; 5 cases were notified the previous year and no deaths.

Infantile Mortality.—There were 566 deaths of Infants under 1 year of age, against 508 in the previous year, this is equal to 190 deaths of Infants under 1 year of age to every 1,000 born. Amongst the chief causes of death were, Diarrhœa (including all forms of this disease) 105 deaths, Marasmus and wasting diseases 138, Convulsions 93. These are all to a very great extent preventable, and are due in the majority of cases to improper feeding, want of cleanliness, and to neglect.

Of these 566 deaths, 200 occurred to the East of Boundary Road, 224 to the West of Boundary Road, 131 North of the Railway, and 11 in Public Institutions.

For the causes of death see Table VI.

Still-born Children.—In addition to the above 566 deaths under 1 year, there were 138 children still-born.

Illegitimate Children.—96 of the births were those of illegitimate children.

Diseases of the Respiratory System.—347 deaths were registered from these diseases, of which 225 were from Pneumonia and 96 from Bronchitis. Deaths from Pneumonia occurred as follows:—

Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct	Nov.	Dec.	Total
15.	14.	11.	14.	28.	31.	16.	17.	6.	22.	20.	31.	225

During the past 10 years the deaths from Pneumonia in Middlesbrough have been:—

1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	Total.
125.	197.	191.	154.	144.	180.	158.	275.	265.	225.	1,914

showing that the tendency of this disease is to become more fatal in the town during recent years, the deaths in the last two or three years being nearly double what they were a few years previously.

I propose during the ensuing year to enquire thoroughly into the causes of this disease, and the conditions under which it is met with, and to report you thereon.

Diarrhœal Diseases.—There were 158 deaths from these diseases, against 59 the previous year, equal to a death rate of 1·7 per 1,000 of the population. 138 were deaths of young children under 5 years of age. The majority occurred in the months of August and September, just after the hot dry summer. As I have mentioned before, improper feeding and want of cleanliness are the main causes of this high death rate amongst young children. The pernicious habit of feeding young infants on skimmed condensed milk, potatoes, and what is known as boily, during the hot summer months are amongst some of the chief of these

Phthisis and Tuberculous Diseases caused 198 deaths, against 177 in the previous year.

The deaths during the past 5 years from these causes have been ;—

1894.	1895.	1896.	1897.	1898.
171.	156.	175.	177.	198.

showing that there has been an increase in death from these causes during the past year Considering, however, the increase of the population the disease is not gaining much ground in the town.

The 198 deaths are composed of 37 from Tabes Mesenterica, 21 from Tubercular Meningitis, 120 from Phthisis and 20 from other Tuberculous Diseases.

Of the 120 deaths from Phthisis, 51 occurred East of Boundary Road, 30 West of Boundary Road, 6 North of Railway, and 23 in Public Institutions. Of the 37 deaths from Tables Mesenterica, 35 were of children under 5 years of age Of those dying from Phthisis 79 were of from 25 to 60 years of age.

In view of the great interest which is being shown all over the country in Tuberculous Diseases and their prevention, I will mention some of the proposals which have been advocated :—

1. That all Sanitary Authorities should possess adequate means for the systematic Pathological (Bacteriological) examination of the milk supplied by retail or by contract in the district, whether it be produced within or without the district. The same to apply to all foreign butter and milk. The addition of preservatives such as boric acid, formalin, salicylic acid, etc., by vendors, whether wholesale or retail, should be entirely prohibited.

2. The abolition of all private slaughter-houses, and the substitution of public abattoirs.

3. All tumours or affections of the udders of milk cows to be notifiable.

4. The power to take samples of milk from any particular cow and the power to prohibit the entrance of milk into any district if there are reasonable grounds for suspecting it to be tuberculous.

Treatment of Tuberculosis.—1 Notification of all Tuberculosis cases Local authorities should undertake, free of charge, the disinfection of houses in which a tuberculous patient has resided, together with the bedding, clothing, and other articles capable of retaining infection.

2. To supply precautionary circulars setting forth the dangers of infection and the measures to be taken to prevent them.

3. To provide a suitable Sanatorium in which Phthisical patients can be isolated and where they can receive the best treatment.

The Work of the Sanitary Department.—For details see the Report of the Chief Sanitary Inspector (Mr. G. Anderson), pages 28 to 33. During the first half of the year the work of the Inspectors in this Department was confined almost exclusively to dealing with the Small-Pox Epidemic. Since August the usual routine duties of the Sanitary Department have been carried out in a very satisfactory manner

The Sanitary Condition of the Town.—Since my appointment as Medical Officer of Health in May, 1898, I have made myself conversant with all the sanitary conditions of the town.

Sewers and Drains (*vide* Reports for the months of June, July, August, September and October).—The Sewers are in many places inadequate in size, and owing to the want of fall sediment quickly deposits and reduces their capacity. The work of clearing out the Main Sewers and Drains is being proceeded with There still remain Sewers with catch-pits in their course. These should be done away with as soon as possible.

Owing to the outfalls of the Sewers being tide-locked twice in every 24 hours, there is a large accumulation of Sewer Gas, which forces its way up the manhole ventilators into the streets. In some of the narrow streets and at points where there is considerable traffic, there has been a considerable nuisance from this escape of Sewer Gas, and it has been a source of many complaints from the public

Flooding of the Houses in the Marsh Road District—This is another evil caused by the tide-locked outfalls. With an exceptional high tide and a heavy rainfall, the capacity of the Sewer in this district is inadequate and consequently it overflows through the street and other gullies and finds an entrance into the houses. This took place twice in October, viz : on the 18th and 29th Raising the doorstep and the level of the floors in these houses and covering the floors with cement may prevent the water from actually gaining access to the living rooms, but it will not prevent the surrounding ground from becoming vilely polluted and damp, and the district from becoming almost unfit for human habitation.

The scheme of adopting a Pumping Station, whereby the Sewage is kept flowing during the whole of the 24 hours, has been recommended by many, and would prove an inestimable benefit to this district and the town if it obliterated the chance of this flooding ever taking place again. It would also do away with one of the chief causes of the escape of Sewer Gas in such large quantities into the streets of the town.

Excreta Removal.—The systems in operation in the Borough are ashpan closets, midden privies, and water-closets.

The two former are in proportion of about 5 to 1 and the midden privies are being abolished as rapidly as possible. They are undoubtedly a great evil and operate against the sanitary welfare of the town. Not only do they permit of large accumulations of offensive matter close to the houses, but the pit itself cannot be properly disinfected, it having been proved time after time that the germs of Typhoid Fever and other diseases are in a very active form in the soil taken from between the bricks of such pits.

The system of emptying them is one which can only be classed as a disgrace to the sanitary science of this century. To first of all throw the refuse from one of these pits into barrows in the back passage, then for it to be wheeled along the passage, and thrown on to the street where it remains often for several hours, finally being shovelled into carts and taken away, seems to be an unnecessary multiplication of labour, besides being a very effective way of spreading disease. Ashpan closets are a very great advance on this system, but they also have their disadvantages, one of which might be remedied by systematically emptying them twice in every week. It is shown that Enteric Fever is twice as prevalent in houses with midden privies as in those with ashpan closets.

For sanitary and statistical purposes the town is divided into three districts, viz. :—North of the Railway, South of the Railway East of Boundary Road, and West of Boundary Road.

North of the Railway.—This comprises what is known as the old part of the town, although not of any real antiquity, the oldest houses being little more than 100 years old. There was a total of 368 deaths in this district during the year, equal to a death rate of 20·53 per 1,000 of its population per annum. Those inhabiting this part of the town are mainly the working class ; there are more narrow (3 feet) back passages here than in the rest of the town, and the houses are closer together and more crowded. Most of the courts and back passages have been paved during recent years, and the sanitary conditions of the district have been greatly improved. Deaths amongst young children have been very prevalent during the year, Convulsions and Diarrhœa being the chief, causing 56 deaths under 1 year of age. This is due to the social condition of the people, and to the mothers in many cases having to work for their living, and so leaving the care of the infants in other hands. Diseases of the Respiratory System caused 21·7 per cent. of the total deaths. The central portion of this district is situated on an eminence of sand and gravel, the highest point of which is 40 feet above Ordnance Datum. This should be a dry and healthy subsoil, and should not favour Diseases of the Respiratory System. The remainder of the district is, however, built on very low lying ground, which is adjacent to the river, and is damp. This, together with the fact that most of the iron and other works of the town are in this quarter, and that there is a large quantity of smoke constantly in the atmosphere, will account for the high death rate from Respiratory Diseases.

East of Boundary Road includes the principal residential parts of the town, Grove Hill and the greater part of Linthorpe being in this district. It also takes in the business portion of the town, the population not being so dense and the houses being of a better class. There were 663 deaths, being at the rate of 15·37 per 1,000 of its population, this low death rate being due to the better social and physical conditions under which the residents live. The houses are chiefly built on stiff clay, which is a cold subsoil and favours Tuberculous Diseases as well as Lung Complaints.

Tuberculous Diseases caused 85 deaths Pneumonia and Bronchitis 101 and Diarrhœa 63. Diseases of the Respiratory System caused a death rate of 17·4 per cent. of the total deaths in the district.

West of Boundary Road.—This is largely and densely populated by the working classes, chiefly those who are employed at the various iron works. The houses are built on low lying ground, much of it being marsh, made up of slag and other materials. It occasionally gets flooded, and is damp and is an unsuitable site for houses. There were 574 deaths during the year in this district, being equal to a death rate of 19·31 per 1,000 per annum of its population. Diseases of the Respiratory System caused 21·3 per cent. of the deaths. Of the other causes of death. Tuberculous Diseases caused 66, Convulsions 43. Diarrhœal 55, and 73 were due to Atrophy, Debility, and Wasting in Infants, 66 of whom were under 1 year of age.

Dairies, Cowsheds, and Milkshops.—In the majority of cases the cowsheds are in good condition, being well paved and clean. No overcrowding of the cows was met with.

Some of the defects found were, in 6 cases the only water for the cows was that from a stagnant pond in the field, in two instances pigs were kept in a shed adjoining the cow-house, in another hens were allowed to roost in the cow-house, this house was dirty and full of lumber. In the majority of cases the milk never goes into a dairy, being taken straight into the town. The cans are usually kept in the scullery of the house and were clean, but vegetables such as onions are often stored in close proximity to the cans, and are liable to taint them. In the small retail milk shops there is great room for improvement. At present any shopkeeper on applying to be registered can sell milk. It is often found that this milk is kept in a small shop in close proximity to a cask of paraffin oil, or a bag of onions. The shop is not clean, and there is a constant traffic in and out past the bowl containing the milk, which in a great many instances is not found to be covered over More discretion should be exercised in granting a license to sell milk, and such unsuitable shops as described above should be prohibited from selling it.

Summary of Reports Made during the Year 1898:—

February.—Hospital accommodation and Small-Pox.

March.—Small-Pox and Vaccination.

April.—Small-Pox and Scarlet Fever.

May.—Pneumonia, Sewer Gas, and Drainage.

June.—Pneumonia, its Propagation and Prevention, Sewers and Sewage, Vaccination.

July.—Cleansing of Sewers, Street Dust, and the Diseases Propagated by it.

August.—Diarrhœal Diseases.

September.—Diarrhœa amongst young Children and its causes. Preservatives in milk. Slaughter-houses. The evil habit of Children playing in back streets close to Privy doors.

October.—Pneumonia and Diarrhœa. Typhoid Fever. Flooding of the Houses in the Marsh Road District.

November.—Cowsheds, Milk Shops, and Dairies

December.—Infectious Diseases in Schools.

New Houses.—Since July 31st, 1897, to December 31st 1898, 750 new houses have been erected and occupied, representing an increase of 4,269 persons in the Borough during that period.

The Population at the 1891 Census was returned as 75,532, estimated to the middle of 1897 it was 89,246, it is now estimated to be 93,515.

For the Report on the Factory and Workshops Act, Food and Drugs Act, and the Common Lodging-Houses, see the Inspector's Report, pages 28 to 33.

I have the honour to be, Gentlemen,

Your obedient Servant,

CHARLES V. DINGLE, M.D., B.Hy., etc.,

Medical Officer of Health

The Health Department,
Municipal Buildings,
Middlesbrough,
February, 1899

TABLE I.

The Rates (Birth Death, Infantile Mortality, and Zymotic) in the 32 Largest Provincial Towns for 1897 were :—

32 LARGEST TOWNS	Population.	Death Rate per 1,000.	Birth Rate per 1,000	Infantile Deaths under 1 year to 1,000 Births.	Zymotic Death Rate per 1,000.
West Ham	273,682	15·7	32·2	172	2·62
Croydon	121,171	13·1	25·0	135	1·43
Brighton	121,401	15·1	24·7	144	1·64
Portsmouth	182,585	16·2	26·9	168	2·53
Plymouth	97,658	19·0	28·5	185	2·17
Bristol	232,242	17·2	27·8	149	1·83
Cardiff	170,063	14·9	31·1	151	2.19
Swansea	100,309	15·8	27·4	140	1·36
Wolverhampton	87,287	22·5	35·1	217	4·22
Birmingham	505,772	21·6	33·3	214	3·88
Norwich	110,154	18·8	30·5	194	2·21
Leicester	203,599	17·7	30·6	205	3·13
Nottingham	232,934	18·8	28·9	206	2·81
Derby	103,291	16·0	27·1	168	1·91
Birkenhead	111,249	18·3	31·6	164	2·45
Liverpool	633,078	24·4	35·3	200	3·83
Bolton	121,433	22·0	32·5	186	4·02
Manchester	534,299	23·1	33·2	195	3·81
Salford	213,190	23·9	35·1	219	5·50
Oldham	145,845	19·2	26·1	183	2·61
Burnley	106,122	19·5	29·8	220	3·98
Blackburn	131,330	19·5	27·7	206	3·45
Huddersfield	101,454	16·4	23·4	131	1·50
Halifax	95,747	16·5	22·5	140	1·39
Bradford	231,200	17·5	24·0	179	2·22
Leeds	409,472	19·9	31·6	190	2·80
Sheffield	351,848	21·2	34·4	198	3·49
Hull	225,045	18·6	33·3	181	3·25
Sunderland	142,107	19·7	34·6	165	2·56
Gateshead	101,070	18·3	35·8	172	2·33
Newcastle	217,555	19·1	31·3	178	2·09
Preston	115,103	24·4	31·9	262	5·64
Middlesbrough, 1898	89,246	21·77	32·5	190	4·2

TABLE II.—Summary of Death Rates and Birth Rates.

1898	North of Railway	East of Boundary Road	West of Boundary Road	Public Institutions	Total Deaths	Total Death Rate	Births	Birth Rate	Corrected Death Rate
January	19·13	18·51	11·78	20	145	19·12	261	34·43	19·12
February	13·11	12·56	12·56	51	156	22·61	203	29·56	22·44
March...	22·19	16·21	26·88	107	263	35·36	291	39·11	34·55
April	19·51	13·32	20·41	48	174	23·39	235	31·59	22·96
May	23·04	10·20	16·07	29	141	18·60	221	29·14	18·20
June	26·56	18·48	14·17	19	156	21·26	259	35·91	20·96
July	23·11	11·93	23·56	18	155	20·86	229	30·21	20·40
August	19·13	14·23	25·92	11	156	20·54	271	35·74	20·54
September	27·23	19·06	27·18	13	185	25·40	237	32·30	24·59
October	21·74	20·44	14·77	18	155	20·44	234	30·86	20·44
November	15·24	11·41	15·77	20	119	16·00	231	31·06	15·73
December	16·47	18·17	22·75	15	162	21·36	232	30·60	21·34
1898	20·53	15·37	19·31	369	1,967	22·0	2,904	32·5	21·77
1897	20·55	13·49	19·23	197	1,706	19·16	2,956	33·35	—

TABLE III.

	BIRTHS, 1898.			DEATHS, 1898.		
Months	Male	Female	Totals	Male	Female	Totals
January	142	119	261	76	69	145
February	91	112	203	99	57	156
March	137	154	291	163	100	263
April...	110	125	235	90	84	174
May	115	106	221	80	61	141
June	114	145	259	87	69	156
July	109	120	229	89	66	155
August	133	138	271	82	74	156
September	115	122	237	93	92	185
October	109	125	234	83	72	155
November	115	116	231	65	54	119
December..	119	113	232	82	80	162
Totals...	1,409	1,495	2,904	1,089	878	1,967

Birth Rate for Year = 32·52 per 1,000 per annum.

Death Rate for Year = 22·04 per 1,000 per annum.

Eliminating Deaths of Non-Residents the Death Rate = 21·77 per 1,000 per annum.

The average Death Rate for the past 10 years is 20·30 per 1,000 per annum. There is an excess of 86 Female Births over Male Births, and an excess of 211 Male Deaths over Female Deaths.

TABLE IV.—Summary of Ages at Death in the Four Quarters of the Year 1898.

AGE PERIODS	1ST QUARTER OF YEAR				2ND QUARTER OF YEAR				3RD QUARTER OF YEAR				4TH QUARTER OF YEAR				Total Deaths in the different Age Periods
	East of Boundary Road	West of Boundary Road	North of Railway	Public Institutions	East of Boundary Road	West of Boundary Road	North of Railway	Public Institutions	East of Boundary Road	West of Boundary Road	North of Railway	Public Institutions	East of Boundary Road	West of Boundary Road	North of Railway	Public Institutions	
Under 1 year of age	63	42	22	4	35	43	30	5	50	85	47	—	52	54	32	2	566
1 and under 5 years	38	26	18	10	30	22	15	2	21	55	17	3	22	27	10	3	319
5 and under 10 years	5	3	1	18	6	3	2	3	4	4	1	—	3	1	1	1	56
10 and under 15 years	1	3	1	5	2	5	1	3	4	2	2	3	2	1	1	2	38
15 and under 25 years	15	6	2	29	11	2	9	12	6	1	3	2	7	7	5	4	121
25 and under 60 years	40	28	25	99	37	28	34	55	41	27	24	14	47	39	24	25	587
60 years and over	27	9	10	14	33	14	14	15	40	17	9	14	21	20	8	15	280
Totals	189	117	79	179	154	117	105	95	166	191	103	36	154	149	81	52	1,967

Totals in the Quarters—1st Quarter. . 564 2nd Quarter... 471 3rd Quarter... 496 4th Quarter... 436

TABLE V.—Deaths in Public Institutions during 1898.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
The Workhouse	6	8	13	10	6	14	11	4	6	12	16	10	116
Infirmary ...	2	3	4	3	11	3	6	1	4	3	2	3	45
Sanatorium ...	12	40	90	35	12	1	...	3	1	2	1	1	198
Nazareth House	...	...	...	...	...	1	1	3	2	1	1	1	10
Totals	20	51	107	48	29	19	18	11	13	18	20	15	369

For the causes of these deaths see Pages 22 to 27.

TABLE VI.—Causes of Death of Children under 1 Year of age during 1898.

Disease.	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Totals
Small-Pox	3	2	...	...	5
Diphtheria	2	...	...	...	2
Diarrhœa	10	5	71	19	105
Convulsions	23	19	23	28	93
Dentition	2	4	8	3	17
Whooping Cough	3	...	...	...	3
Premature Birth	14	23	5	14	56
Marasmus and Wasting	30	25	39	39	133
Tuberculous Diseases	5	13	12	3	33
Lung Diseases	17	8	11	22	58
Thrush	1	...	...	...	1
Erysipelas	...	...	...	1	1
Congenital Syphilis	1	...	...	1	2
Purpura	...	...	...	1	1
Croup	1	...	..	...	1
Congenital Malformations	1	5	2	2	10
Locomotive System	1	...	...	..	1
Nervous System	4	1	1	4	10
Lymphatic System	...	...	...	1	1
Suffocation	...	1	1	1	3
Urinary System	1	...	...	...	1
Measles	6	1	7	...	14
Circulatory System	1	1	1	1	4
Digestive System	3	3	1	...	7
Natural Causes	2	2	...	...	4
Totals	131	113	182	140	566

TABLE VII.—Notifications received from Medical Practitioners during the various months of 1898.

1898.	Small-pox	Scarlet Fever	Diphtheria	Enteric Fever	Puerperal Fever	Croup	Erysipelas	Continued Fever	Typhus Fever	Totals
January ...	32	24	15	22	1	3	7	...	...	104
February ...	637	18	8	18	...	1	6	1	...	689
March	518	19	2	20	...	..	10	...	...	569
April	145	32	3	13	...	...	18	..	1	212
May	44	27	4	18	1	...	15	...	...	109
June	14	9	2	10	...	...	6	...	...	41
July	5	14	6	12	...	1	4	...	...	42
August ..	2	9	1	13	...	1	5	...	...	31
September ...	...	23	1	23	...	1	5	...	...	53
October ..	...	26	4	42	...	...	6	..	...	78
November ...	...	18	2	30	1	...	9	...	..	60
December ...	...	18	6	13	...	...	7	...	...	44
Totals ...	1,397	237	54	234	3	7	98	1	1	2,032
1897	12	245	38	166	5	5	93	7	Nil	571

TABLE VIII.—Showing the Wards in which the notifiable diseases occurred during 1898.

1898. Wards	Small-Pox	Scarlet	Diphtheria	Typhoid	Typhus	Continued	Puerperal	Croup	Erysipelas	
Ayresome	158	43	10	35	1	...	...	2	14	263
Acklam	171	27	5	28	...	...	..	1	15	247
Cannon	247	30	3	30	...	...	...	2	7	319
Cleveland	94	29	6	27	...	1	...	...	11	168
Exchange	101	16	3	15	...	...	...	1	9	145
Grove Hill	64	24	4	13	...	...	1	...	4	110
Linthorpe	55	14	6	13	...	..	...	...	4	92
Marsh	140	17	9	25	...	..	...	..	14	205
Newport	271	22	5	24	...	...	1	1	6	330
Vulcan	96	15	3	24	..	...	1	...	14	153
Total	1,397	237	54	234	1	1	3	7	98	2,032

TABLE IX.—Deaths from the principal ZYMOTIC DISEASES.

Disease	East of Boundary Road	West of Boundary Road	North of Railway	Public Institutions	Totals
Scarlet Fever	3	2	1	2	8
Small-Pox	10	5	Nil	183	198
Diphtheria	7	5	Nil	2	14
Measles	17	29	15	2	63
Whooping Cough ...	8	1	Nil	Nil	9
Enteric (Typhoid) Fever...	13	9	3	7	32
Typhus Fever	Nil	Nil	Nil	1	1
Continued Fever	1	Nil	Nil	Nil	1
* Diarrhœa and Dysentry...	26	24	5	2	57
Totals	85	75	24	199	383

* Does not include Gastric Enteritis and Enteritis and the other causes of Diarrhœa.

Representing a death rate from these Zymotic Diseases of 4·2 per 1,000 per annum of the total population.

The percentage of deaths to notifications in notifiable diseases (which include Small-Pox Scarlet, Enteric, Continued, Puerperal and Typhus Fevers, Membranous Croup and Erysipelas and Diphtheria) has been 12·4 per cent.

TABLE X.—Showing the number of Typhoid Fever cases and the various Wards in which they occurred during the twelve months.

Wards	Ayresome	Acklam	Cannon	Cleveland	Exchange	Grove Hill	Linthorpe	Marsh	Newport	Vulcan	
January	4	1	3	1	2	2	2	1	3	3	22
February	...	3	3	...	1	1	3	1	3	3	18
March	6	4	2	...	2	2	2	1	...	1	20
April	..	1	2	...	2	1	2	4	...	1	13
May	...	2	2	1	1	...	1	3	1	7	18
June	...	...	...	1	3	...	1	3	2	...	10
July	...	1	4	4	1	...	...	...	1	1	12
August...	...	2	1	2	...	...	1	2	5	...	13
September	8	3	5	5	...	...	...	...	1	1	23
October	6	5	2	9	3	4	...	5	5	3	42
November	8	5	1	4	...	2	1	4	2	3	30
December	3	1	5	..	...	1	...	1	1	1	13
Total	35	28	30	27	15	13	13	25	24	24	234

TABLE XI.—Showing the number of cases of Enteric (Typhoid) Fever in the Wards, and the kind of Closet in use.

There are five times as many Ashpan Closets in use as there are Ashpits.

1898. Wards	Number of Typhoid Fever Cases notified.			
	Ashpits	Ashpans	W.C.'s.	Total
Ayresome	..	32	3	35
Acklam	3	25	...	28
Cannon	20	10	...	30
Cleveland	17	10	...	27
Exchange	5	9	1	15
Grove Hill	...	12	1	13
Linthorpe	1	9	3	13
Marsh	3	19	3	25
Newport	9	15	...	24
Vulcan	10	11	3	24
Total	68	152	14	234

TABLE XII.

Table of Deaths during the year 1898 in the County Borough of Middlesbrough classified according to Diseases, Ages and Localities.

Name of Locality adopted for the purpose of these Statistics	Mortality from all Causes at subjoined age periods								Mortality from subjoined Causes, distinguishing Deaths of Children under Five Years.																					
	At all Ages	Under 1 Year	1 and under 5 Years	5 and under 10 Years	10 and under 15 Years	15 and under 25 Years	25 and under 60 Years	60 Years and over		Small-pox	Scarlatina	Diphtheria	Membranous Croup	Typhus	Enteric or Typhoid	Continued	Relapsing	Puerperal	Erysipelas	Measles	Whooping Cough	Diarrhoea and Dysentery	Rheumatic Fever	Ague	Phthisis	Bronchitis Pneumonia and Pleurisy	Heart Disease	Injuries	All other Diseases	Total
The County Borough of Middlesbrough	1967	566	319	56	38	121	587	280	Under 5 Years	13	7	6	8	..	..	1	..	..	2	62	9	45	..	..	12	131	5	2	582	885
									5 Years and upwards	185	1	8	2	1	32	..	..	2	1	1	..	12	..	1	108	194	107	28	399	1,082
Deaths occurring within the District among persons not belonging thereto									Under 5 Years	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	2
									5 Years and upwards	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	4	2	1	1	12	22

RETURN OF DEATHS, FROM ALL CAUSES, AT DIFFERENT AGE PERIODS IN THE VARIOUS DISTRICTS FOR THE YEAR 1898.

CAUSE OF DEATH	South of Railway—East of Boundary Road								South of Railway—West of Boundary Road								North of Railway								Public Institutions								
	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. ond under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	
I.—Specific, Febrile, or Zymotic Diseases.																																	
1. MIASMATIC DISEASES.																																	
1—Small-Pox	.	...	1	...	4	5	...	10	...	...	...	...	1	4	...	5	4	...	...	...	...	...	..	...	5	8	16	6	33	112	3	183	198
2—Measles	2	15	...	...	...	.	...	17	8	20	1	...	...	...	...	29	...	11	...	...	...	...	...	15	...	2	...	...	...	...	...	2	63
3...Scarlet Fever (Scarlatina)	...	3	...	...	..	...	...	3	...	2	...	...		...	..	2	...	1	...	...	...	...	...	1	...	1	...	...	1	...	...	2	8
4—Diphtheria	1	1	2	...	...	2	1	7	1	3	...	1	..	...	...	5	.	...	...	...	...	...	...	...	...	...	2	...	...	...	...	2	14
5—Whooping Cough ...	3	5	...	...	...	...	...	8	...	I	...	...	...	...	...	1	...	..	...	...	...	..	...	...	...	..	...	...	...	...	...	...	9
6—Typhus Fever	...	..	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	1	...	1	1
7—Enteric or Typhoid Fever	...	...	1	...	3	8	1	13	...	...	1	4	1	3	...	9	...	...	1	...	...	2	...	3	..	...	2	...	4	1	...	7	32
8—Simple Continued and Ill-defined Fever ...	...	1	..	...	...	...	...	1	...	...	...	..	...	..	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	1
9—Influenza	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	1	1	...	...	...	...	...	..	...	...	1
2. DIARRHŒAL DISEASES.																																	
1—Diarrhœa, Dysentery ...	15	5	2	...	...	...	4	26	13	7	1	...	...	...	3	24	4	...	...	...	...	1	...	5	1	...	...	...	...	1	...	2	57
3. MALARIAL DISEASES.																																	
1—(*e g.*, Remittent Fever, Ague)	...	...	...	...	...	..	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	1	...	1	1
5. VENEREAL DISEASES.																																	
1. Syphilis..	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	2	...	...	...	...	...	...	2	...	...	...	...	...	...	1	1	4
6. SEPTIC DISEASES.																																	
1—Erysipelas	1	1	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	..	...	...	...	1	..	1	...	...	...	...	...	...	...	...	3
2—Pyæmia, Septicæmia ...	...	...	...	..	...	1	...	1	..	...	...	...	...	1	...	1	...	...	...	1	...	...	...	1	...	1	...	...	...	...	..	1	4
3—Puerperal Fever ...	..	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	..	...	1	...	1	..	...	...	...	...	1	...	1	2
II.—Parasitic Diseases.																																	
1—Thrush	1	1	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2

Return of Deaths—*continued.*

CAUSE OF DEATH	South of Railway—East of Boundary Road								South of Railway—West of Boundary Road								North of Railway								Public Institutions								
	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	
III.—Dietic Diseases.																																	
1—Chronic Alcoholism, Delirium Tremens ...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1	4	...	...	...	...	...	...	1	1	...	...	...	...	...	5	1	6	11
IV.—Constitutional Diseases.																																	
1—Rheumatic Fever and Rheumatism of Heart...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2—Rheumatism	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	4
3—Rickets	...	2	...	...	...	...	...	2	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
4—Cancer, Malignant Disease	...	...	...	...	...	13	6	19	...	...	...	...	...	9	2	11	...	...	...	...	...	3	3	6	...	...	...	...	...	6	1	7	43
5—Tabes Mesenterica ...	7	5	1	...	...	...	...	13	7	9	...	...	...	...	...	16	5	2	1	...	...	...	...	8	...	...	...	...	...	...	...	...	37
6—Tubercular Meningitis, Hydrocephalus ...	1	3	2	...	1	...	...	7	6	6	...	...	...	...	...	12	...	...	...	...	1	...	...	1	...	...	...	1	...	...	...	1	21
7—Phthisis	...	...	...	3	9	36	3	51	3	4	...	...	4	17	2	30	...	5	...	...	4	7	...	16	...	...	...	...	1	19	3	23	120
8—Other Tubercular and Scorfulous Diseases ...	2	6	...	2	2	2	...	14	...	...	1	...	1	...	...	2	2	2	...	...	...	...	...	4	...	...	...	...	...	...	...	...	20
9—Purpura, Hæmorrhagic Diathesis	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	2	3
10—Anæmia, Chlorosis, Leucocythæmia ...	...	...	...	...	...	3	1	4	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5
11—Glycosuria, Diabetes, Mellitus	...	...	...	...	...	1	1	2	...	...	...	...	...	2	...	2	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	5
V.—Developmental Diseases.																																	
1—Premature Birth ..	20	...	...	...	...	...	...	20	21	1	...	...	...	...	...	22	11	1	...	...	...	...	...	12	4	...	...	...	...	...	...	4	58
2—Congenital Malformations...	5	...	...	...	...	...	...	5	5	...	...	...	...	...	...	5	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	11
3—Old Age	...	...	...	...	...	...	24	24	...	...	...	...	...	...	11	11	...	...	...	...	...	1	7	8	...	...	...	...	...	8	18	26	69

Return of Deaths—*continued.*

CAUSE OF DEATH	South of Railway—East of Boundary Road								South of Railway—West of Boundary Road								North of Railway								Public Institutions								
	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	
VI.—Local Diseases.																																	
1. DISEASES OF NERVOUS SYSTEM.																																	
1—Inflammation of Brain or Membranes	3	9	2	1	2	...	...	17	2	9	1	1	...	1	...	14	3	3	...	...	...	1	...	7	...	...	...	...	2	...	..	2	40
2—Apoplexy, Softening of Brain, Hemiplegia, Brain Paralysis ...	...	...	...	...	...	10	20	30	...	...	...	..	...	4	8	12	...	...	...	...	...	3	8	11	...	...	...	...	..	...	2	2	55
3—Insanity, General Paralysis of the Insane	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	1	1	2	3
4—Epilepsy	..	...		...	1	...	..	1	...	...	1	..	...	...	..	1	...	..	...	...	...	...	...	...	...	...	...	...	1	...	1	2	4
5—Convulsions	36	9	1	..	...	...	..	46	31	12	...	...	...	...	...	43	26	7	...	..	...	...	...	33	...	...	...	...	..	...	...	...	122
6—Laryngismus Stridulus (Spasm of Glottis) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	1	..	...	...	...	...	...	1	...	...	...	...	...	..	..	...	1
7—Paralysis Agitans. Paraplegia, Disease of Spinal Cord	...	..	...	1	...	2	1	4	...	...	...	...	..	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	1	...	1	6
8—Other Diseases of Nervous System ..	...	...	...	...	...	2	...	3	...	..	...	...	...	...	..	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	..	...	4
2. DISEASES OF CIRCULATORY SYSTEM.																																	
1—Endocarditis, Valvular Diseases of Heart ...	...	...	1	1	1	13	15	31	1	...	...	...	2	12	7	22	...	...	...	...	1	22	9	32	..	...	...	...	...	5	1	6	91
2—Pericarditis	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
3—Other Diseases of Heart	1	..	1	...	...	4	4	10	1	1	...	...	...	1	...	3	...	..	...	...	1	5	...	6	...	1	...	...	...	...	1	2	21
4—Aneurism	...	...	...	..	...	...	1	1	...	..	...	...	...	...	...	...	1	...	...	...	...	1	..	2	...	...	...	..	...	1	...	1	4
5—Embolism, Thrombosis	...	...	...	...	...	...	...	...	..	..	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	2	...	2	2
6—Other Diseases of Blood Vessels	...	...	...	...	...	1	2	3	..	...	...	...	...	...	...	..	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Return of Deaths—*continued.*

CAUSE OF DEATH	South of Railway—East of Boundary Road								South of Railway—West of Boundary Road								North of Railway								Public Institutions								
	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	
VI.—Local Diseases.																																	
DISEASES OF RESPIRATORY SYSTEM.																																	
1—Croup	..	4	1	...	...	..	...	5	1	2	1	...	...	...	...	4	...	1	...	...	...	...	..	1	...	...	...	...	...	...	...	...	10
2—Laryngitis	...	...	...	...	...	...	...	...	...	1	...	.	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
3—Bronchitis	8	3	...	...	1	7	11	30	9	10	..	...	..	10	8	37	9	3	...	1	...	7	6	22	...	...	...	...	...	1	5	6	96
4—Pneumonia	13	25	...	1	6	25	11	81	14	19	1	1	3	27	9	74	8	11	...	...	3	26	3	51	...	2	...	1	...	12	4	19	225
5—Pleurisy	...	...	...	...	1	...	...	1	...	...	...	...	...	1	1	2	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	4
6—Emphysema, Asthma...	..	...	...	...	...	1	2	3	...	...	...	...	...	4	1	5	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	..	9
7—Other Diseases of Respiratory System ...	...	. .	...	...	...	1	...	1	..	...	...	..	...	..	...	..	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	2
4. DISEASES OF DIGESTIVE SYSTEM.																																	
1—Dentition	3	4	...	...	..	...	...	7	11	4	...	...	...	...	...	15	2	...	...	...	...	...	..	2	1	. .	...	...	...	...	...	1	25
2—Tonsillitis, &c. ..	...	...	...	...	...	.	...	...	...	...	...	1	...	...	...	1	..	...	...	..	...	...	...	...	...	...	...	...	..	..	...	...	1
3—Diseases of Stomach ..	1	...	...	...	...	2	4	7	3	2	...	...	1	...	...	6	...	...	...	...	...	...	...	...	..	...	...	...	1	...	...	1	14
4—Enteritis	29	5	...	...	1	2	...	37	16	7	..	...	...	7	1	31	27	4	...	...	...	1	.	32	...	...	...	...	...	1	..	1	101
5—Peritonitis	1	...	...	...	...	2	...	3	...	2	1	1	...	..	...	4	...	...	1	...	...	2	..	3	...	...	1	...	1	...	..	2	12
6—Obstructive Diseases of Intestine	1	...	1	..	1	1	..	4	...	...	...	1	...	2	...	3	...	...	...	1	...	...	...	1	...	...	...	...	...	3	...	3	11
7—Ascites	...	...	1	...	..	...	..	1	...	...	...	...	...	...	...	...	..	...	..	...	...	...	...	...	..	...	...	...	...	...	..	...	1
8—Cirrhosis of Liver ...	...	...	...	...	2	1	1	4	...	...	...	...	...	1	...	1	..	...	...	...	...	2	...	2	...	...	...	...	..	...	...	...	7
9—Jaundice and other Diseases of Liver ...	...	1	...	...	..	1	..	2	1	..	2	...	..	...	...	3	...	...	...	...	1	1	...	2	...	...	...	...	...	1	...	1	8
10—Other Diseases of Digestive System ...	...	...	...	...	1	1	...	2	...	...	..	1	...	2	...	3	...	...	..	..	...	...	...	...	...	...	...	...	...	1	...	1	6
5. DISEASES OF LYMPATHIC SYSTEM.																																	
1—(*e g.*, of Lymphatics and of Spleen)	1	...	...	...	...	...	1	2	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2

Return of Deaths—*continued.*

CAUSE OF DEATH	South of Railway—East of Boundary Road								South of Railway—West of Boundary Road								North of Railway								Public Institutions								
	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	
6. Diseases of Glandlike Organs of uncertain use.																																	
1—(*e.g.*, Bronchocele, Addison's Disease) ...	...	...	...	...	...	...	1	1	..	...	...	...	...	..	...	...	..	...	...	...	...	...	...	...	..	...	...	..	...	...	...	...	1
7. Diseases of Urinary System.																																	
1—Nephritis	1	...	...	...	...	1	...	2	...	...	...	...	...	..	...	...	...	1	1	...	...	..	...	2	...	...	...	...	...	1	1	2	6
2—Bright's Disease, Albuminuria	...	...	...	...	..	2	1	3	...	...	...	...	...	1	..	1	...	...	...	...	...	2	...	2	...	...	...	...	...	2	...	2	8
3—Disease of Bladder and of Prostrate ...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	..	...	...	...	...	..	...	...	...	..	...	...	...	...	...	...	..	...	1
4—Other Diseases of the Urinary System ...	...	...	1	...	...	1	...	2	...	..	...	...	...	1	1	2	...	...	...	...	...	...	1	1	...	...	...	...	...	..	..	...	5
8. Diseases of Reproductive System.																																	
1—Accidents of Childbirth	...	...	...	...	...	1	...	1	...	...	...	...	...	2	...	2	...	...	...	...	...	1	...	1	..	...	...	...	...	...	...	...	4
9. Diseases of Locomotive System.																																	
1—Caries, Necrosis ...	1	1	...	...	1	1	...	4	...	...	...	..	...	...	1	1	...	..	...	1	...	...	...	1	...	...	...	...	...	1	...	1	7
10. Diseases of Integumentary System.																																	
1—(*e.g.*, Carbuncle, Phlegmon, Cellulitis) ...	...	...	...	...	1	1	...	2	..	...	...	..	...	1	...	1	...	...	...	...	...	...	...	...	..	. .	...	...	..	...	1	1	4
2—Other Diseases of Integumentary System ...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	3	3	4

Return of Deaths—*continued.*

CAUSE OF DEATH.	South of Railway—East of Boundary Road								South of Railway—West of Boundary Road								North of Railway								Public Institutions.								
	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	Under 1 Yr.	1 Yr. and under 5	5 Yrs. and under 10	10 Yrs. and under 15	15 Yrs. and under 25	25 Yrs. and under 60	60 Yrs. and upwards	Total	
VII.—Violence.																																	
1. ACCIDENT, NEGLIGENCE, &C.																																	
1—Cut, Stab	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	1
2—Burn and Scald ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	2	1	1	...	...	...	4	5
3—Poison	...	...	...	...	...	2	...	2	...	...	...	...	1	...	1	2	...	...	...	...	...	1	...	1	...	...	...	...	...	1	...	1	6
4—Drowning... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	4	1	...	6	...	...	...	...	...	...	...	...	6
5—Suffocation ...	...	...	...	...	...	3	...	3	1	...	...	...	...	...	...	1	2	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	6
6—Hernia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	1
7—Accidental Injuries	...	...	...	...	1	...	2	3	...	...	...	...	...	...	1	1	...	2	...	...	...	6	2	10	...	...	1	3	3	7	2	16	30
2. HOMICIDE.																																	
1—Murder and Manslaughter	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	1
3. SUICIDE.																																	
1—Hanging	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	1
VIII.—Deaths from Ill-defined and not Specified Causes.																																	
1—Debility, Atrophy, Inanition	40	2	...	...	1	1	...	44	66	7	...	...	...	...	...	73	27	3	...	...	1	...	...	31	...	...	...	...	...	...	2	2	150
2—Tumour	...	...	...	...	...	...	1	1	...	...	...	...	...	1	1	2	...	...	...	...	1	...	...	1	...	...	...	...	...	1	...	1	5
3—Abscess	1	...	...	...	...	1	...	2	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
4—Hæmorrhage ...	1	...	...	...	...	2	...	3	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
5—Natural Causes ...	...	...	...	...	...	...	1	1	2	...	...	...	...	1	...	3	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	1	7
TOTAL ...	200	111	18	9	41	163	121	663	224	130	11	11	16	122	60	574	131	61	4	5	19	106	42	368	11	18	23	12	47	199	52	362	1967

SANITARY INSPECTOR'S ANNUAL REPORT FOR 1898.

Sanitary Department,
Municipal Buildings, Middlesbrough.

To the Chairman and Members of the Sanitary Committee.

Gentlemen,--I have the honour to lay before you my Twelfth Annual Report on the operations of the Sanitary Department.

During that period there were 4,403 Notices served on Owners to abate the undermentioned Nuisances.

Back Yards Relaid with Scoriæ Bricks, Concrete, &c.	201
Back Yards Repaired	74
Back Passages Relaid with Scoriæ Bricks, Concrete, &c.	28
Back Passages Repaired	64
Dilapidated Ashpits and Privies	401
Old Ashpits Abolished	64
Pail Closets Substituted	112
Dilapidated Ashpans (New Ones Provided)	879
Foul Drains Cleansed	529
Defective Drains (Gullies Required)	120
Sink Drains Disconnected from Sewers and Trapped	43
Dilapidated Spouting and Fall Pipes	274
Ashpit Doors Off (New Ones Fixed)	147
Privy Doors and Seats Off (New Ones Fixed)	224
Defective Pail Closets, Reduced to size of Ashpans	86
Offensive Deposits	4
Dilapidated Yard Walls	8
Dilapidated Dwelling-House Roofs	5
Foul Cellar Drains Cleansed	15
Dilapidated Manure Pits Repaired	2
Offensive W.C.'s (New W.C.'s with Ventilating Shafts Re-fixed)	8
Offensive W.C.'s Repaired	3
Pail Closet Doors Off (New Ones Fixed)	401
Offensive Fowls Removed from Back Yards	23
Foul W.C.'s Drains Trapped	7

Dilapidated Scullery Floors Laid with Concrete	35
Dilapidated Sink Stones (New Ones Fixed)	23
Defective Sink Waste Pipes	23
Dilapidated Cellar Floors Re-Laid with Concrete	6
Dilapidated Tripe House Floor Re-Laid with Concrete	1
Dilapidated Stable Yards Repaired with Scoriæ Bricks	3
Dilapidated Gully Covers (New Ones Fixed)	57
Dilapidated Cow Byre Floor Re-Laid with Concrete	1
Offensive Ditch (7 Notices served)	1
Offensive Water under Dwelling Houses (Floors Filled Up)	14
Lime Washing Yards and Premsies	117
Horses Removed from Back Yards	4
Offensive Dwelling Houses	2
Public Health Notices	399

The foregoing particulars only represent the cases where formal Notices have been served, and do not include Nuisances prevented or abated by the verbal request of your Inspectors.

N.B.—One Notice frequently deals with several separate Nuisances.

MAIN DRAINS.

In addition to the above, our own Staff have cleared 5,255 yards of Main Drains in Back Passages and relaid with proper gradients 386 yards.

571 yards of Glazed Stoneware Pipes have also been relaid, in lieu of old broken Land Tiles, Segments, &c.

12 new Flushing and Examination Chambers have been constructed, 13 new Gullies, Grates and Frames have been fixed, and 300 Manholes have been emptied and cleansed.

DISEASED AND UNWHOLESOME FOOD.

During the year 8 seizures of Diseased and Unwholesome Food were made.

Number.	Articles.	Weight.
5	Beef	2,716 lbs.
1	Pork	336 ,,
1	Mutton	112 ,,
1	Geese (24)	

In 7 instances the Articles of Food were seized and destroyed with the sanction of the Owners, notice having been previously given to your Inspector. One Butcher was summoned before the Magistrates and fined £40 and costs.

SLAUGHTER HOUSES.

Number on Register, Private Slaughter Houses	40
,, Public ,, ...	2
Total	42

It is with regret that I have to report that the Public Slaughter Houses have again this year failed to pay their way. The supervision is too close for the class of butchers who previously used them, and they crowd into small private Slaughter Houses and suffer any inconvenience rather than kill in our commodious Slaughter Houses under direct supervision. The 40 Private Slaughter Houses have been regularly inspected and the Bye-Laws strictly enforced.

OFFENSIVE TRADES.

Number on Register—Tripe Boilers	15
,, Tallow Chandler	1
,, Tallow Melter	1
,, Soap Boiler	1
,, Gut Scrapers	2
Total	20

The above have been regularly inspected, and, as far as the trade would allow, kept in a fairly clean condition.

MILK SHOPS, DAIRIES AND COWSHEDS.

Number on Register—Milk Shops	439
,, Dairies	12
,, Cowsheds	24
Total	475

The Daries and Cowsheds have been regularly inspected and kept in fairly clean state, each year the whole of the latter being limewashed.

Many of the smaller premises registered for the Sale of Milk are unsuitable for the purpose owing to the variety of articles sold, it is not an infrequent occurrence to find Milk, Paraffin Oil, Onions, and even Coals sold in the same shop. We, however, keep the various premises as clean as the nature of the sales will allow.

FACTORY AND WORKSHOP ACT, 1891.
SHOP HOURS ACT, 1892.

During the year a large amount of valuable work has been done in regard to carrying out the provisions of the above important Acts.

During that period 49 additional Workshops have been registered, and 16 having changed their address have been re-registered, 18 have been erased, the Proprietors having left the town or given up business.

We have on the Register at present 490 Workshops and 46 Outworkers' manufacturing and repairing materials in their own homes.

In all 1,506 visits have been made and the Bye-Laws strictly enforced.

SMALL-POX AND OTHER INFECTIOUS DISEASES.

At the beginning of 1898, 11 cases of Small-Pox were under medical treatment in the Sanatorium, and notwithstanding that every conceivable precaution was adopted to prevent this terrible disease from spreading in the town, it continued to increase, and assumed Epidemic proportions on February 7th, on which day 75 cases were notified to the Medical Officer of Health.

Our Hospital accommodation was then exhausted, and the patients being left in their homes, the disease spread with alarming rapidity, during one week—viz., February 26th to March 4th—276 cases being notified.

The Committee, with commendable promptitude, set to work to provide additional Hospital accommodation. They also authorised me to engage whatever additional assistance was required in my Department; indeed, it was owing to their indefatigable energy at this unhappy period that we were enabled to cope with this loathsome disease so effectually.

Early in March sufficient Hospital accommodation had been provided for all known cases, and the patients were quickly removed from their homes to the Sanatorium, and all houses, bedding, &c., thoroughly disinfected.

We were fortunate in having two Ambulances, and with the addition of a Cab purchased by the Committee, we were enabled to remove 66 cases in one day.

On March the first the town sustained a great loss by the untimely and painfully sudden death of our esteemed Medical Officer of Health, Dr. Malcomson, who fell a victim to over-work.

Dr. Dingle, of Newcastle, at a very short notice came to our assistance, and when the Epidemic was over, the Sanitary Committee recognised the valuable services he had rendered to the town by appointing him Medical Officer of Health.

When cases of infectious disease are treated at home they are visited frequently and instructions given to prevent the spreading of the disease, disinfectants are supplied free, and houses, bedding, &c., thoroughly disinfected immediately upon recovery. We also send notice to schools that children have been attending to prevent them or others residing in infected houses returning to school before the prescribed time has elapsed.

A total of 2,035 cases of infectious disease have been notified to the Medical Officer of Health during the year. Enquiries were instituted into their cause or origin, necessitating 8,140 visits by your Inspectors, 1,443 cases being removed to the Sanatorium for treatment. 6 cases belonging to other Local Authorities were also removed to the Sanatorium by your Inspectors, making a total of 1,449.

1,535 rooms have been thoroughly stoved and disinfected.

FOOD AND DRUGS.

During the year 41 Samples of Food have been procured and submitted to Mr. J. E. Stead, (Borough Analyst), for analysis, with the under-mentioned results :—

No. of Samples.		Genuine.	Doubtful.	Adulterated,
Milk	12	12	...	...
Butter	13	11	..	2
Lard	7	5	2	...
Tea	2	2	...	...
Oatmeal	2	2	...	...
Whole Meal ...	1	1	...	...
White Pepper ...	1	1	...	...
Yeast	1	1	...	...
Perchloride Mercury	1	1	...	...
Carbolic Acid ...	1	1	...	...
	41	37	2	2

COMMON LODGING-HOUSES.

The number of Common Lodging Houses within the Borough is 21, and all are situate on the North side of the Railway.

The Houses registered contain 161 rooms for sleeping purposes and afford accommodation for 993 lodgers nightly.

These have been regularly inspected and kept as far as possible in a clean state.

PROSECUTIONS BEFORE THE MAGISTRATES.

Offence.	Result.
Concealing a case of Small-Pox in dwelling-house	Fined £2 and costs.
Offensive Stables	To abolish Stables and thoroughly disinfect other premises within six days and pay costs.
Dilapidated Ashpan	To abate Nuisance forthwith and pay costs.
Dilapidated Ashpan (second offence) ...	To abate Nuisance forthwith and fined 10s. and costs.
Refusing to remove Horse from back yard	To remove Horse and abolish Stable within fourteen days and pay costs.
Exposing Diseased Meat for Sale (third offence)	Fined £40 and costs.
Selling Butter adulterated with 80 per cent. of foreign fats ...	Fined £2 and costs.
Selling Butter adulterated with 75 per cent. of foreign fats	Fined £2 and costs.

I cannot conclude without expressing my sincere thanks to the Inspectors under my charge for the energetic and fearless manner in which they discharged the disagreeable and dangerous duties that fell to their lot during the Epidemic that raged in our midst during the first six months of this year.

From early morning until midnight (Sundays included) they laboured in a manner that cannot be too highly commended.

I am, Gentlemen, your obedient Servant,

GEORGE ANDERSON, Assoc. San. Inst.,

Chief Sanitary Inspector.

APPENDIX A.

COUNTY BOROUGH OF MIDDLESBROUGH

SANATORIUM REPORT FOR THE YEAR 1898.

To the Chairman, Alderman Jos. McLauchlan, and Members
of the Sanatorium Committee.

Gentlemen,—I beg to submit my Report for the year ending December 31st, 1898.

During the past year the work done at the Sanatorium has been very great, no less than 1,449 patients having been medically treated there. The large majority (1,290) were Small-Pox patients.

In January the whole of the buildings were devoted to the admission and treatment of Small-Pox patients, no other infectious diseases being admitted. To cope with the large numbers, temporary iron and wood buildings were erected, provision being made for 822 beds. The Staff was also increased, and for a period it consisted of the Matron (Miss K. Bell), an Assistant Matron and a Night Superintendent of Nurses, 65 Trained Nurses, 35 Female Servants, and 28 Men Servants.

For a time there were four resident Medical Men and a Clergyman. No less than 780 patients were in the Hospital at one time.

In May it was found possible to again admit other infectious diseases to a separate part of the Hospital.

Small-Pox.—During 1898, 1.290 patients suffering from Small-Pox were treated. Of these 187 died and 1,103 recovered, the death rate being equal to 14·5 per cent. of the total admissions.

For the Report on these cases see Appendix B.

Scarlet Fever.—There were 73 admissions and 2 deaths—a death-rate of 2·7 per cent. For particulars see Tables I. and II.

Enteric (Typhoid Fever).—86 cases were admitted and there were 7 deaths, a death rate of 8·1 per cent. See Tables I. and II.

The total admissions were 1,449 and the total deaths 196, a death rate from all causes of 13·5 per cent.

TABLE I.

Admissions during the Twelve Months of 1898.

Disease	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Small-Pox ...	35	445	592	146	47	17	5	3	...	...	...	...	1,290
Scarlet Fever	12	...	...	...	5	3	2	7	15	10	8	11	73
Typhoid Fever	4	..	...	...	4	7	8	7	11	19	21	5	86
Totals ...	51	445	592	146	56	27	15	17	26	29	29	16	1,449

TABLE II.

Deaths at the Sanatorium during the Twelve Months of 1898.

Disease	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Small-Pox ..	11	76	71	22	5	1	...	1	...	...	...	...	187
Scarlet Fever	...	...	...	...	...	...	...	2	...	...	...	...	2
Typhoid Fever	2	...	...	...	...	...	...	...	1	2	1	1	7
Totals ...	13	76	71	22	5	1	...	3	1	2	1	1	196

Disinfection of Infected Bedding and Wearing Apparel.—This has necessarily been heavy, the whole of the infected clothes and bedding from the town having passed through the Steam Disinfector as well as enormous quantities of Hospital property.

Buildings, &c —Since the Epidemic the whole of the Buildings have been thoroughly disinfected, painted and renovated, and are now in very good order. More accommodation has been provided for the Nursing Staff.

I have the honour to be, Gentlemen,

Your obedient Servant,

CHARLES V. DINGLE, M.D.,

February, 1899

Medical Superintendent.

APPENDIX B.

Final Report on the Small-Pox Epidemic of 1897 and 1898.

As various Reports have been presented from time to time dealing with this Epidemic and the steps taken to meet it, I will now deal chiefly with the Statistical side of it.

The first case to be notified was on November 22nd, 1897, and the last occurred on August 15th, 1898. Altogether 1,411 persons were attacked.

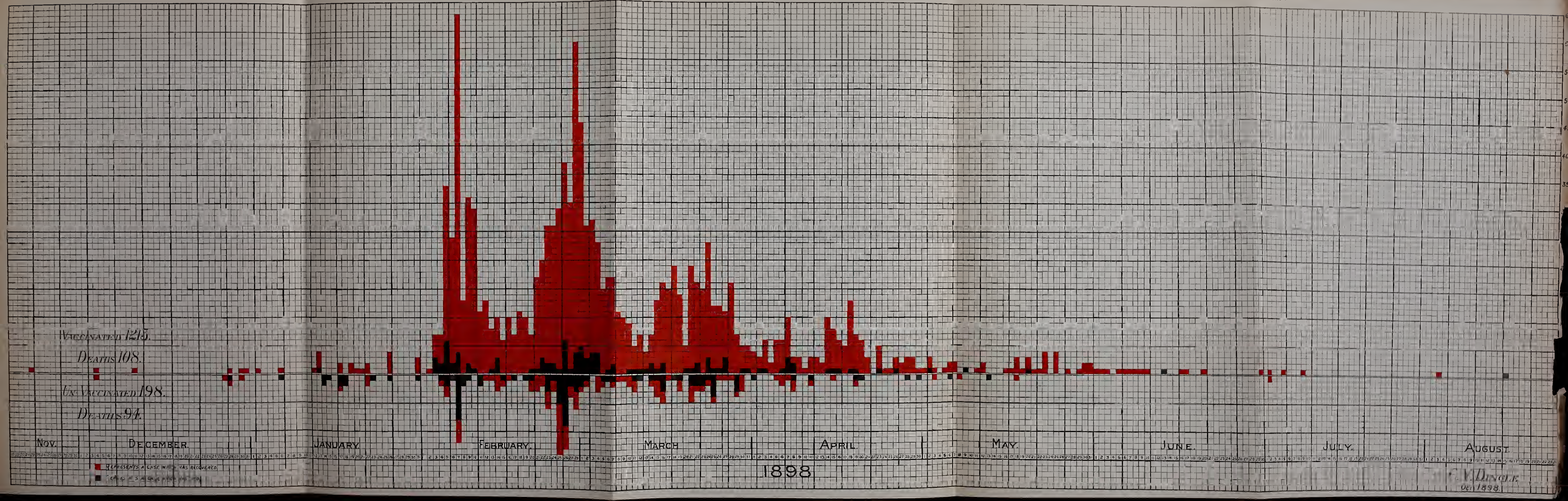
The Origin of the Epidemic.

Various theories have been propounded as to its origin, amongst which may be mentioned :—1st, the visit of a Wild Beast Show to the town, on November 10th and 11th, 1897. 2ndly, importation by the Ships trading between Spain and Middlesbrough with iron ore. 3rdly the influx of some 800 Navvies, who were engaged by the Electric Tram Company in laying the new tram lines.

Taking into consideration the fact that the town had hardly been free from Small-Pox for seventeen years, cases having occurred in varying numbers every year during that period, I think we must look for the origin beyond a casual event, such as the visit of a Show for two days, or the arrival of some Navvies into the district. Looking to the fact that a great number of Ships arrive daily in the river from infected ports—Small-Pox having been known to be at that time raging in the Spanish ports from whence the iron ore is obtained, that these Ships remain several days in these ports and that the men send their clothes ashore to be washed, and knowing that Small-Pox was detected on similar Ships trading with other English ports about the same time that the outbreak began here, it seems to me that this is by far the most likely origin. Another piece of evidence which strengthens this conviction is the fact that a negro sailor, who is the husband of one of the first two cases to have been attacked with Small-Pox in Middlesbrough, is said by a fellow sailor, who served on the same ship with him at Sea, to have had Small-Pox. This man, who lives at Grimsby, says he himself contracted Small-Pox from this negro, the negro was at home at the time the outbreak began in Middlesbrough. The history of the wake and the manner in which the Epidemic spread are well-known.

There were 1,120 houses attacked, the total number of cases notified being 1,411, showing that the disinfection of the houses carried out by the Sanitary Staff was remarkably efficacious in preventing the spread of infection in those houses. In these, 1,120 houses there were 6,725 inhabitants, of whom 4,221 were adults over 14 years of age, and 2,504 were children under 14 years of age.

CHART showing the Daily Notifications of Small Pox during the Middlesbrough Epidemic, divided into Vaccinated and Unvaccinated Cases, and the Deaths in each class.



During the Epidemic a house to house census was taken by the Guardians with the following result :—

The enumerated population, *i.e.*, those found at home, was 69,525, or about two-thirds of the total estimated population. Of these, 68,217 were found to have been primarily vaccinated, 1,306 were unvaccinated, including 653 children under 14 years of age; 14,163 had been re-vaccinated, *i.e.*, about one-fifth of the enumerated population, and 4,015 had had Small-Pox.

Of the 1,411 persons attacked, 1,213 had been primarily vaccinated, and 198 were unvaccinated (amongst the unvaccinated are included those never submitted for vaccination, those who may have been submitted but on whom no marks of vaccination were visible, and those who were only vaccinated during the incubation of their attack of Small-Pox). The attack rates in the two classes were 1·3 per cent. of the vaccinated population, and 11·7 per cent. of the unvaccinated population.

Of the 1,213 vaccinated persons 108 died, equal to a fatality of 8·8 per cent.

Of the 187 un-vaccinated persons 94 died, equal to a fatality of 47·4 per cent. The total fatality was equal to 14·31 per cent. of cases attacked.

Of the 1,411 cases 807 were males, and 604 females.

Among the children who were attacked, there were 107 under ten years of age, of whom 45 were vaccinated, and 62 unvaccinated (vaccination marks of the 45—16 had 4 marks, 6 had 3 marks, 13 had 2 marks, and 10 had 1 mark). Of these 45 vaccinated children none died, whilst of the 62 unvaccinated children under 10 years of age attacked 29 (*i.e.* 46·7 per cent.) died. This is a very noticeable fact and should point strongly to the value of vaccination, which, although in these cases did not protect the 45 vaccinated children from attack, nevertheless clearly saved the lives of about half of them.

There is also another point which is clearly demonstrated on looking at the Tables of age periods (Table A). of those attacked, and that is that in the vaccinated class the percentage of deaths steadily increases with the age of the patient. There are no deaths under 10 years of age among the vaccinated, from 10 to 15 years of age the fatality was equal to 1·6 per cent. of cases attacked; from 15 to 25 years of age it was 5·0 per cent. of cases attacked; from 25 to 60 years of age 13·1 per cent.; and over 60 years of age 50·0 per cent.

This points out clearly that the protective value of primary vaccination gradually fades in the course of time, and that re-vaccination becomes the only means of renewing this protection. On turning to the unvaccinated class you will see quite a different course of events. Under 1 year the percentage of deaths was 71·4 per cent. of cases attacked; 1 to 5 years of age 44·4 per cent. ; 5 to 10 years 43·5 per cent. ; 10 to 15 years 19·0 per cent. (compared with 1·6 per cent. in the other class). After this age period in both classes the fatality percentage increases, since unless re-vaccination is resorted to the two classes become more or less allied, although by comparing the Table it is seen that the fatality still continues to be by far the greater in the unvaccinated class.

These are facts which cannot be gainsayed by anyone who is willing to examine them carefully, and impartially. They are prepared with every care as to accuracy, from carefully kept records, and they have been worked out with an absolute impartiality as to whether they would favour Vaccination or Anti-Vaccination. They point out their own moral.

Re-Vaccination.—Very few re-vaccinated persons were attacked, the total being 87. Of these, 56 had been re-vaccinated during the incubation period of the disease, these cannot be counted as successful re-vaccinations. Of the remaining 31, 7 had been re-vaccinated more than 10 years before attack, viz. :—

1	42	years	before
1	13	,,	,,
2	20	,,	,,
1	30	,,	,,
2	12	,,	,,
7			

Of the remaining 24, 15 had been re-vaccinated for periods ranging from 16 to 48 days, 3 for periods of 6 weeks, 4 for periods ranging from 1 to 4 months, and 2 for periods ranging from 1 to 4 years.

These are classed as successfully re-vaccinated cases only on the strength of their having submitted themselves to the operation.

On making enquiries into these cases it was found that 16 of them had been submitted for re-vaccination between the dates of February 11th and 14th, on which days there was so great a crush at the Vaccination Stations that proper supervision could not be possible. 2,180 people attended one Station during these four days to have the operation performed, and for it not be successful is very possible, many causes tend to this. The Lymph may possibly have got rubbed off the arm by the clothes being resumed before it was dry, or by brushing up against someone else, or by its not having got properly inocculated into the arm. In all which cases there might remain a scar, or mark, on the arm for many weeks afterwards from the scarification of the skin with the Lance, without vaccination having taken place at all. Besides these 16 cases, which are very doubtful re-vaccinations, there are 8 others. The following marks, including both primary and re-vaccination were found on them :—

1 re-vaccinated 18 days had 2 good marks.
1 „ 40 days had 4 very faint marks, equal to ½ square inch in area.
1 „ 1 year had 1 very small mark.
1 „ 4 years had 2 very poor marks.
1 „ 25 days had marks = 1¼ square inch in area, but there had been no loss of tissue or foveation.
1 „ 39 days had 3 very faint marks.
1 „ 24 days had no marks visible.
1 „ 48 days had 2 faint marks.
8

There were no deaths among those who had been successfully re-vaccinated more than 10 days, or less than 10 years prior to their attack.

Out of the 87 returned as re-vaccinated cases, the following 6 died, viz :—

2 re-vaccinated 6 days before attack.
1 „ 7 „ „ „
1 „ 8 „ „ „
2 „ 10 years before attack.

TABLE A.

Showing the Age Periods and Fatalities in the two Classes—Vaccinated and Unvaccinated.

Age Periods.	Total Attack.	Among Vaccinated.			Among Unvaccinated.		
		Persons Attacked.	Died.	Fatality per cent. of Attacks.	Persons Attacked.	Died.	Fatality per cent. of Attacks.
Under 1 year	10	3	0	0·0	7	5	71·4
1 to 5 years	25	7	0	0·0	18	8	44·4
5 to 10 „	72	35	0	0·0	37	16	43·5
10 to 15 „	141	120	2	1·6	21	4	19·0
15 to 25 „	477	435	22	5 0	42	16	37 2
25 to 60 „	679	607	81	13 1	72	45	62·5
60 and over	7	6	3	50·0	1	0	0 0
All ages	1,411	1,213	108	8·8	198	94	47 4

TABLE B.

Comparison of Fatalities among Children Under 10 Years of Age From the Final Report of the Royal Commission on Vaccination.

Epidemic at	Vaccinated.			Unvaccinated.		
	Attacks.	Deaths.	Fatality.*	Attacks.	Deaths.	Fatality.*
Sheffield	353	6	1·7	228	100	43·9
London	130	6	4·6	228	61	26·7
Dewsbury	45	1	2·2	174	56	32·1
Warrington	33	2	6·0	32	12	37·5
Leicester	2	0	0·0	107	15	14·0
Gloucester	26	1	3·0	680	279	41·0
Middlesbrough ...	**45**	**0**	**0·0**	**62**	**29**	**46·7**

* Per cent. of attacks.

TABLE C.

Analysis of Marks and Quality of Vaccination of 1,213 Vaccinated Persons attacked.

Age Periods	1 mark.		2 marks.		3 marks.		4 marks.		Totals.
	Good.	Bad.	Good.	Bad.	Good.	Bad.	Good.	Bad.	
Under 1 year	1	...	...	...	1	...	1	...	3
1 and under 5 years	...	1	3	...	...	...	3	...	7
5 and under 10 ,,	7	1	10	...	4	1	12	..	35
10 and under 15 ,,	13	1	26	8	24	5	31	12	120
15 and under 25 ,,	48	5	108	18	66	9	148	33	435
25 and under 60 ,,	88	17	208	69	101	19	84	21	607
60 years and over	1	...	3	1	1	..	...	...	6
Totals	158	25	358	96	197	34	279	66	
Grand totals	183		454		231		345		1,213

TABLE D.
Re-Vaccinated Cases.

Age Periods	Time, in Days, of Re-vaccination before Attack															Years	Totals
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Days or Months		
Under 5 years	...	..	...	...	...	1	...	...	...	...	...	...	...	...	1*	...	2
5 and under 10	...	...	...	...	...	...	...	...	...	...	...	..	...	1	1†	...	2
10 and under 15	...	...	...	1	1	...	...	...	...	...	2	...	3	...	4‡	...	11
15 and under 25	1	...	....	...	1	1	3	2	4	3	1	2	...	...	10§	...	28
25 and under 60	4	...	...	2	...	2	5	2	2	3	2	1	3	2	6‖	9¶	43
60 and over ...	...	...	..	...	...	...	...	...	...	...	1	...	...	...	...	...	1
Totals	5	...	...	3	2	4	8	4	6	6	6	3	6	3	22	9	87

*		Re-vaccinated	25 days.	Date of re-vaccination,	February	25th.
†		”	29 ”	”	”	11th.
‡	1	”	36 ”	”	”	12th.
	1	”	47 ”	”	”	12th.
	1	”	2 months	”	”	14th.
	1	”	6 weeks	”	”	11th.
§	1	”	24 days	”	April	7th.
	1	”	20 ”	”	February	13th.
	1	”	16 ”	”	”	12th.
	1	”	23 ”	”	”	12th.
	1	”	1 month	”	”	14th.
	1	”	36 days	”	”	12th.
	1	”	6 weeks	”	”	11th.
	1	”	39 days	”	”	27th.
	1	”	48 ”	”	”	28th.
	1	”	18 ”	”	”	25th.
‖	1	”	22 ”	”	”	12th.
	1	”	41 ”	”	”	12th.
	1	”	40 ”	”	”	17th.
	1	”	2 months	”	”	14th.
	1	”	6 weeks	”	”	14th.
	1	”	4 months	”	”	14th.
	22					

Where ? by
What lymph
mostly P.V.
Station
probably
with the
same stock
of lymph

It is seen that no less than 16 of these cases were vaccinated between the dates of February 11th and 14th, 1898.

¶ 1 re-vaccinated 42 years ago
1 ,, 13 ,,
2 ,, 20 ,,
2 ,, 12 ,,
1 ,, 30 ,,
2 ,, 1 ,,
—
9

Of the above cases, 6 died, viz. :

2 re-vaccinated 6 days
1 ,, 7 ,,
1 ,, 8 ,,
2 ,, Over 10 years
—
6

This shows that during the severe Epidemic no one died who had been re-vaccinated 14 days and more before contracting the fever. The protective value of vaccination has usually passed off after ten years, and is not to be relied upon.

TABLE E.

The following Table gives the number of cases attacked with Small-Pox whilst undergoing, or having recently undergone, primary vaccination :—

Age Periods	Number of Days primarily Vaccinated before Attack															Totals
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Days or Months	
Under 5 years ...	..	...	...	...	1	1	...	...	...	...	1	1	...	...		4
5 and under 10 ...	...	..	...	...	...	1	1	1	2	1	1	...	1	1		9
10 and under 15...	...	...	...	...	...	2	...	...	2	...	...	...	...	1	2...1 month each*	7
15 and under 25...	...	...	..	...	1	...	...	...	1	...	1	..	...	...		3
25 and under 60...	...	...	...	...	...	......	...	1	...	1	2	2	..	...	1...22 days 1...43 days *	8
60 and over ...	..	...	...	...	...	...	...	...	...	...	...	...	...	...		
Totals	...	...	...	...	2	4	1	2	5	2	5	3	1	2	4*	31

* These 4 cases are included in the Table as successfully vaccinated cases.

It is again found that a large proportion of the above cases, 12 in number, were vaccinated between the dates of February 10th and 14th, 1898, viz. :

1 vaccinated 6 days, the vaccination done on February 11th.
1 ,, 8 ,, ,, ,, ,, 11th.
1 ,, 9 ,, ,, ,, ,, 12th.
1 ,, 10 ,, ,, ,, ,, 13th.
1 ,, 10 ,, ,, ,, ,, 10th.
1 ,, 11 ,, ,, ,, ,, 14th.
1 ,, 11 ,, ,, ,, ,, 14th.
1 ,, 11 ,, ,, ,, ,, 12th.
1 ,, 11 ,, ,, ,, ,, 11th.
1 ,, 1 month ,, ,, ,, 11th.
1 ,, 22 days ,, ,, ,, 11th.
1 ,, 43 ,, ,, ,, ,, 11th.

Deaths among cases primarily vaccinated during Epidemic. Of such cases, 9 died, viz. :

1 vaccinated 5 days
1 ,, 6 ,,
2 ,, 8 ,,
1 ,, 9 ,,
1 ,, 10 ,,
1 ,, 12 ,,
1 ,, 1 month
1 ,, 7 days
—
9

4 of these cases come under the list of those vaccinated between February 10th and 14th.

TABLE F.

Analysis of marks, and quality of vaccination of the 108 cases who died.

Age Periods	1 Mark		2 Marks		3 Marks		4 Marks		Totals
	Good	Bad	Good	Bad	Good	Bad	Good	Bad	
10 to 15 years	...	...	1	...	...	...	1	...	2
15 to 25 years	1	1	5	4	3	...	8	...	22
25 to 60 years	12	6	26	15	10	1	7	4	81
60 years and over	...	...	1	1	1	...	...	...	3
Totals	13	7	83	20	14	1	16	4	...
Grand Totals ...	...	20	...	53	...	15	...	20	108

This Table again points to the fact that it is the want of re-vaccination which was at fault as there were no deaths during the 10 years which followed the primary vaccination, but the longer the interval between the primary vaccination and the attack, by so much greater is the fatality, the greatest number died in the age period 25 to 60 years.

Population

TABLE G.

Table giving the number of cases which occurred in the various Wards of the town.

WARDS.	No.	WARDS.	No.
Ayresome	158	Grove Hill	64
Acklam	171	Linthorpe	55
Cannon	247	Marsh	140
Cleveland	94	Newport	271
Exchange	101	Vulcan	96
	771		626

Total in Wards, 1,397.

TABLE H.

Severity of Attack with Number of Vaccination Marks in 161 cases.

Severity of Case.	Cases with 4 Vac. Marks.			Cases with 3 Vac. Marks.			Cases with 2 Vac. Marks.			Cases with 1 Vac. Mark.					
	Total Cases.	Recovered.	Died.	Total Cases.	Recovered.	Died.	Total Cases.	Recovered.	Died.	Total Cases.	Recovered.	Died.	Total Recovered.	Total Died.	Number Attacked.
Discrete	35	35	...	26	26	...	49	48	1	25	24	1	133	2	135
Confluent	3	3	...	1	1	...	5	2	3	3	2	1	8	4	12
Coherent	3	3	...	2	2	...	...	...	...	4	3	1	8	1	9
Hœmorrhagic	2		2	...	..	...	3	...	3	...	...	...	...	5	5
Totals	43		2	29	29	...	57	50	7	32	29	3	149	12	161

As I had no part in the Treatment of the cases, I have only been able to collect details as to the Severity of the Attack in 161 cases

The following seem to be some of the conclusions pointed out by the above statistics :—

(1) That vaccination, thoroughly and efficiently performed, is a sure and safe protection against liability to attack from Small-Pox (by thoroughly and efficiently, I do not mean vaccination leaving one or two small cicatrices, but the standard of not less than 4 scars, equal to an area of ½ a square inch of foveated cicatrix, required of the Public Vaccinators by the Local Government Board, and I would even advocate an excess of this standard); (2) that vaccination, even when not thorough, may still be a great protection to the life of the patient; (3) that re-vaccination is of as great importance as primary vaccination, and should be enforced at ten-yearly periods; and that (4) vaccination has much of its bad repute owing to the very inefficient manner in which it has been performed in the past. Many medical men seem to think that a vaccination of two small places is quite sufficient protection. This is quite erroneous, and most harmful in practice, as it destroys the belief in the value of vaccination as a protection by reason of those who are thus inefficiently vaccinated contracting Small-Pox. Marks on the arm are not always a proof of a successful vaccination. A scratch which has been neglected may produce a permanent scar.

Your obedient Servant,
CHARLES V. DINGLE, M.D.,
Medical Officer of Health.